



Summary of Evidence Applied Behavior Analysis

Autism Technical Advisory Group

11/14/12



Outline

- Treatment targets and types
- Recent Evidence Reviews
- Recent Recommendations
- Summary



Treatment Goals

- Treatment for Autism Spectrum Disorders (ASD's) can focus on:
 - Core symptoms (communication, play, social skills)
 - Behavioral concerns (self-injury, aggression, self-regulation)
 - Overlap



Treatment Types

- Educational (cognitive and academic skills, communication, adaptive skills)
- Behavioral (attention, self-regulation)
- Medical (medication, supplements, diets)
- Allied health (auditory integration; sensory integration)



Treatment Settings

- Educational treatments provided in Infants and Toddlers, Child Find and Special Education systems.
- Behavioral interventions often part of educational, but target symptoms and quantity have been the question.



Treatment Settings

- Medical treatments – typically provided in health care setting, but difficult to find providers with experience.
- Allied health – provided by therapists either in educational or health care setting.



Applied Behavior Analysis

- Evaluation of behavior using scientific principles followed by design of an intervention to change behavior based on that evaluation.
- Often used to refer to Discrete trial training/Lovaas therapy.



Discrete Trial Training

- Form of ABA that consists of structured sessions in which the child is given prompts to demonstrate a target behavior (such as “look at me”; “put in”; label an object, etc.).
- Target behaviors increase in complexity as the child progresses.



Discrete Trial Training

- Initially recommended 30 to 40 hours a week over 7 days a week.
- Provided by trained therapist under direction of a special education teacher or psychologist for preschool to young elementary school aged children.



Discrete Trial Training

- Early studies (late 80's, early 90's) showed significant gains, but criticized due to methodological limitations.
- Discrete Trial Training more commonly used in more limited fashion as part of comprehensive intervention plan.



Recent Reviews

- 2008 Ospina and colleagues at University of Alberta
 - 31 studies of DTT; 770 participants
 - Inconsistent results but better than no treatment or regular instruction for motor and functional skills
 - Variable results compared to special education
 - No difference compared to other autism specific interventions

Ospina MB, Krebs SJ, Clark B, Karkhaneh M, Hartling L, Tjosvold L, Vandermeer B, Smith V. (2008) Behavioural and Developmental Interventions for Autism Spectrum Disorder: A Clinical Systematic Review. PLoS ONE 3(11): e3755. doi:10.1371/journal.pone.0003755



Recent Reviews

2008 Ospina et al., continued:

- High intensity better than low intensity
- Most studies demonstrating benefit were cohort studies and not randomized trials.
- Other types of behavioral intervention: positive effects for cognitive behavior therapy; limited and inconsistent findings for other combinations.
- Bottom line: Behavioral intervention works, but it is not clear that any one type is more effective than another.



Recent Reviews

- April 2011 review Vanderbilt Evidence-based Practice Center for AHRQ
 - 78 behavioral studies reviewed
 - Overall, positive findings for a variety of behavioral interventions, but strength of evidence low

Warren Z, Veenstra-VanderWeele J, Stone W, Bruzek JL, Nahmias AS, Foss-Feig JH, Jerome RN, Krishnaswami S, Sathé NA, Glasser AM, Surawicz T, McPheeters ML. Comparative Effectiveness Review Number 26; Therapies for Children With Autism Spectrum Disorders. AHRQ Publication No. 11-EHC029-EF. April 2011



Recent Reviews

AHRQ review continued:

- Specifically mentioned Lovaas-based interventions “...report greater improvements in cognitive performance, language skills, and adaptive behavior skills than broadly defined eclectic treatments available in the community. However, strength of evidence is currently low.”



Recent Reviews

AHRQ review continued:

- Bottom line: There is some support for intensive behavioral and developmental intervention (>30 hours per week) but these studies require replication, and need to be studied in non-research settings.



Recent Reviews

- Rand Report published in November 2012 issue of *Pediatrics*
- Consensus guidelines of Technical Expert Panel based on systematic review of evidence
- Rated evidence as High, Moderate, Low or Insufficient.

Maglione MA, Gans D, Das L, Timbie J, Kasari C and Technical Expert Panel, HRSA Autism Intervention Research – Behavioral (AIR-B). Nonmedical Interventions for Children with ASD: Recommended Guidelines and Further Research Needs. *Pediatrics* 2012; 130, Supplement 2; S169.



Recent Reviews

High: High confidence that evidence reflects true effect and further research unlikely to change confidence level.

Moderate: Moderate confidence that evidence reflects true effect and further research may change confidence level.

Low: Low confidence that evidence reflects true effect and further research like to change confidence level and estimate of effect.

Insufficient: Evidence either not available, inconclusive or studies demonstrate no effect.



- Within 16 reviews and meta-analyses there were only 2 randomized trials.
- Moderate evidence found for:
 - Behavioral intervention resulting in improvement in language, adaptive skills and IQ (Not enough evidence to point to use of one curriculum over another)
 - Dose response effect for behavioral interventions on language and adaptive skills



Recent Reviews

- Moderate evidence found for (cont.):
 - Integrated behavioral and developmental interventions (eg Early Start Denver Model, ABA + TEACCH)
 - Social skills training for higher functioning children and adolescents
 - Picture Exchange Communication System (PECS) improving communication and social skills



Recent Recommendations

- December 2008 Autism Task Force Report published by MSDE, Division of Special Education/Early Intervention Services:
Service Delivery Recommendations for Young Children with Autism
- Significant overlap with 2007 Clinical Report published in *Pediatrics*

Myers SM, Johnson CP, COCWD. Management of Children With Autism Spectrum Disorders. *Pediatrics* 2007;120;1162.



Recent Recommendations

Essential Elements:

- Family and interdisciplinary involvement
- Curriculum and Instruction
- Functional approach to behaviors
- Amount of direct intervention
- Assistive technology
- Transition
- Professional Development
- Family Support



Recent Recommendations

- **Curriculum and instruction:** Should occur in a supportive learning environment and be based on the child's developmental level, learning style, strengths, needs and the skill(s) to be taught.



Recent Recommendations

Amount of Direct Intervention:

- Birth to 3 years of age, 10 to 20 hours per week (begin with minimum of 10 hours and increase as tolerated)
- 3 to 5 years, 15 – 30 hours per week (begin with minimum of 15 hours and increase as tolerated)



Recent Recommendations

- RAND Corporation Guidelines for comprehensive intervention:
 - Should begin within 60 days of identification.
 - Must be individualized to strengths and needs
 - Must address family concerns and allow their participation



- RAND Corporation Guidelines for comprehensive intervention (cont.):
 - Children should receive direct intervention for a minimum of 25 hours per week 12 months a year.
 - Older individuals should also receive direct intervention but models of service and amount of time are inconclusive



Recent Recommendations

- **RAND Corporation guidelines (cont.):**
 - Interventions specifically targeting social communication and social skills should be offered to individuals with ASDs.
 - Those with limited language or not improving in multiple interventions for communication should be offered the opportunity to use PECS with ongoing monitoring and intervention.
 - Augmentative or Alternative Communication should be considered if PECS not successful.



Summary

- Children with ASDs require individualized interventions to address communication, play skills, cognitive skills and challenging behaviors.
- Structured behavioral interventions based on a functional analysis of behavior are effective for children with ASDs.



Summary

- No one type of intervention works better for all children with ASDs.
- ASDs are neurodevelopmental disorders that affect learning and daily functioning, so it is difficult to distinguish between educational and non-educational needs.



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